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NRO REVIEW COMPLETED

9 May 1963

MEMORANDUM FOR: Deputy Assistant Director, OSA

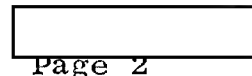
SUBJECT : Project OXCART - Security  
(Meeting re FOD [ ] - 6 May 1963)

1. From 0815 until 1155 a meeting was held [ ] to discuss the problem of Foreign Object Damage to Project aircraft engines. In attendance were: General Marshall Carter, DDCI, Dr. Herbert Scoville, Jr., DD/R, Mr. Clarence L. (Kelly) Johnson, Lockheed, [ ] Lockheed, [ ] Pratt & Whitney, [ ] Pratt & Whitney, Mr. John Parangosky, CIA, [ ] CIA, [ ] CIA, [ ] Base Commander, [ ] Materiel, [ ] Chief, Ops, [ ] Sheffield Edwards, Director of Security, CIA, [ ] Deputy Chief, Support, [ ] Colonel Leo Geary, AFIGO-S, Arthur Smith, USAF, San Bernadino, [ ] Senior Security Officer, [ ] OSA West Coast Security Officer, and the writer.

2. Dr. Scoville chaired the meeting and it commenced by Mr. Kelly Johnson giving a briefing on his analysis of the nature, probable cause and recommended remedial action for the FOD. At the outset Mr. Johnson passed out copies of a summary of all cases of FOD to Project engines. The summary had been prepared by [ ] (See Attachment #1.) Referring to the information set forth in the attachment, Mr. Johnson pointed out that there appeared to be no set pattern in the Foreign Object Damage cases except that it uniformly occurred when the engines were going through a ground run up at military power. He discounted the possibility that foreign objects were sucked into the engine from the ground, pointing out that the engines are high above the ground level and that experience in a similar environment in commercial jet airliners has shown that foreign matter is not sucked into the engine from the ground under these circumstances.

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3. Exhibiting a schematic drawing of a cross section of the nacelle, Mr. Johnson explained at length that the probable cause of the FOD is miscellaneous objects (pieces of "joe-bolts," nuts, broken drills, etc.) left in the nacelle which during the ground run up is sucked into the engine. He pointed out that there has been no problem with FOD when the vehicle is airborne since in that situation air is drawn through the front of the nacelle and passes into the engine without transporting pieces of foreign matter from the nacelle through the engine. During ground run up, on the other hand, since due to the stationary position of the aircraft air enters the nacelle through several openings, and in the process of circulating around the nacelle probably transports miscellaneous debris through the engine. Kelly Johnson explained that screens have been inserted in various openings in the nacelle, but strangely enough no pieces of foreign material have ever been found in the screens except two pieces of tin foil. He exhibited two plastic bags containing several bits of rivets, etc., which he explained were obtained when the nacelles of the latest aircraft were put through a "shake" test at Burbank. He poured these little pieces of debris on top of a sample of the screen which has been incorporated in the nacelle and shaking the screen, several of the smaller pieces came through the wire mesh. He pointed out, therefore, that the foreign material could pass through the screen. He stated, however, that it was difficult to understand why no foreign material (other than the tin foil) was ever found stuck in the wire mesh in the nacelles. A representative of Pratt & Whitney suggested the possibility that the smaller pieces (the ones which could penetrate the wire mesh) possibly were moved by the reverse air flow to the wire mesh and consequently through it before the larger pieces reached the screen, and thus the damage was effected before any of the larger pieces even reached the screen.

4. Mr. Johnson employing a sample cross section of a segment of the nacelle in the by-pass bleed area explained that he felt that with the incorporation of "flapper" valves in this area air could pass out, but not in, during the ground run up, and thus a probable opening for the entry of foreign objects would be eliminated.

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5. Considerable discussion ensued with regard to various other possible causes of this damage. In addition considerable conversation was had with regard to the nature of the damage to the blades and whether or not the engines could be safely employed, although damaged, for vacuum cleaning nacelles.

6. Several participants observed that the procedures currently employed by Lockheed in the hangars [REDACTED] leave much to be desired since it appeared that the work force was performing in a rather careless manner which performance undoubtedly contributed to the foreign material getting into the nacelle. Mr. Johnson agreed that the procedures definitely needed tightening up. Dr. Scoville suggested the possibility of providing the work force with "bunny" suits, without pockets, as an added precaution against miscellaneous objects inadvertently falling into the nacelle. Mr. Johnson took violent exception to this suggestion pointing out that the union has been pushing Lockheed to provide coveralls for the workers for many years, and he felt certain the company would not go along with setting a precedent. He furthermore indicated that a man working on an aircraft could not effectively work without pockets to hold miscellaneous tools, etc. This subject was discussed heatedly for some time. It was also suggested to Mr. Johnson that a procedure could well be put into effect whereby there would be accountability for tools, joe-bolts, etc. Here again, Mr. Johnson took violent exception to this suggestion indicating that it was impracticable and would slow down the program more than Foreign Object Damage. He took similar exception to the proposal that instead of the worker carrying joe-bolts in his tool box or on his person, that another individual accompany the worker and provide him the tools as required.

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7. The merits of shaking the nacelles was discussed. Mr. Johnson stated that the procedure served a purpose during the period before the nacelle was incorporated into the aircraft. He decidedly would not agree with Dr. Scoville's suggestion that two of the later aircraft be broken down and the nacelles put through the shake process. Mr. Johnson stated in positive terms that he felt that to go through such a procedure would probably result in more FOD than if the nacelles

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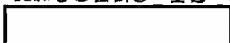
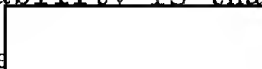
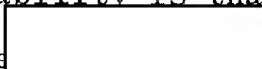
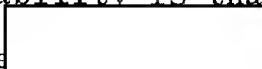
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were not removed from the aircraft, pointing out that to remove the nacelle you have to disconnect many connecting parts and after the shake process undoubtedly much more foreign material would be added back into the nacelle. This went back and forth for some time. General Carter noted that in the plastic bag containing foreign material removed from a nacelle there were two broken drills. Kelly Johnson explained that due to the hardness of titanium, drills frequently break. He was posed a question as what the worker does when he breaks a drill and knows, therefore, that a piece of the drill is inside the nacelle. There was no answer to this question and it appeared that the worker does not do anything under such circumstances. It was suggested by several people that the worker should at least inform the inspector or other appropriate supervisor that this piece of foreign material was added to the interior of the aircraft. Mr. Johnson was asked as to what would be done or what could be done to remove such an object, and he stated that it would be necessary to cut out a piece of the nacelle and he stated that if that was done each time the whole nacelle would be completely weakened.

8. Mr. Johnson mentioned that the nacelles are being x-rayed and foreign material is being located in this manner. However, it is quite apparent that all such material is not being retrieved. With regard to the shaking process, it was emphasized that although a nacelle is quite clean at Burbank and at the time it arrives  the probability is that  since men are working on the nacelle constantly  foreign material is added to the "clean" nacelle 

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9. At about the mid-point of the conference, Dr. Scoville suggested that the writer comment upon the security situation and the possibility of sabotage playing a part in the Foreign Object Damage. The writer reviewed briefly the broad aspects of the security program designed for Project OXCART mentioning that the standards for investigation being employed were far and above the standards utilized in any other government operation wherein numerous contractor employees were utilized. It was emphasized that rigid security precautions were taken in

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all operational areas including industrial facilities fabricating component parts for the OXCART vehicle. It was mentioned, for example, that it has always been the policy of this Security Staff to require that a special agent of the Office of Security escort the J-58 engines from Florida to [ ] as insurance against tampering with the engine en route. It was observed that we had reviewed and re-reviewed the security procedures currently in effect and feel confident that adequate safeguards are in existence to preclude unauthorized access [ ] and even within the confines [ ] An effective system of compartmentation is enforced which limits access to the aircraft itself (and engines) to those individuals [ ] who "must have" access to that area.

10. It was also pointed out that through the facilities of the Office of Security we had initiated a program of testing the security [ ] by the utilization of penetration teams. To date it was mentioned that we have received extremely favorable reports upon the perimeter of security. Observing that sabotage must of necessity be deemed possible, it was noted by the writer that our review indicates that if sabotage is being effected it is undoubtedly being done [ ] and more precisely in the hanger and adjacent areas wherein access could be had to the aircraft and its engines. The heart of the problem, therefore, would appear to exist in this group of [ ] people who are authorized access to this area. It was observed that we recognize that a possible saboteur could be a disaffected worker (contractor employee, government worker or military) or an individual suffering from a mental disorder. Mention was made of the fact that we had reviewed the Security files and had encouraged the Lockheed Security people to similarly review their files of personnel having access to the inner heart of the operation [ ] The review failed to disclose any significant derogatory information, and it was emphasized that during our investigations, we not only emphasize the security aspects but also suitability, mental stability, history of disaffection, etc. To date, therefore, our review has not disclosed any indication of an individual who might be causing the damage.

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11. It was mentioned that we considered the possibility of employing close circuit television and for many reasons decided that that was not the solution. We had considered the possibility of assigning one or more Security Officers to actually watch each engine; however, quickly concluded that this in itself would not be an effective solution. This was apparent since it would be extremely difficult for a Security Officer, no matter how well qualified, to be able to discern whether or not a worker being authorized to work on the aircraft is not in fact performing an act of sabotage. It was recognized that probably other than the psychological effect the only benefit of assigning Security Officers to such a task would be that they might observe acts of carelessness. It was observed by the writer that the security of the inner area of the base could be considerably strengthened if there was more effective communication by the LAC supervisory personnel and the Security Staff [REDACTED]. It was mentioned, for example, that in the past, the LAC supervisory people have not been too cooperative in enabling the Chief, Security, [REDACTED] to conduct security indoctrination briefings, and further, they did not communicate promptly indications of labor unrest. An example of the latter point was made with regard to the Petition of Grievances recently submitted by LAC workers [REDACTED] which was submitted to Lockheed management, and Security, at the base or at Headquarters, was not promptly apprised. At this point Mr. Johnson inquired as to whether or not it was desired that Security be apprised of every grievance filed by a unit member. Several members of the group immediately observed why not. In effect then, the undersigned emphasized that it appeared most desirable that Lockheed supervisory people [REDACTED] work much more closely with [REDACTED] the Senior Security Officer at the base.

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12. [REDACTED] at that point, was invited to add to my comments, and he observed that he had conducted many inquiries amongst the people working in proximity to the aircraft and in addition has made many other checks locally and has not developed any indication of possible sabotage. He remarked that he has analyzed the pattern of damage and

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has concluded that no real pattern exists. It was [redacted]  
[redacted] observation that the security controls presently  
in effect are working, and he seriously doubted if the  
FOD was due to sabotage.

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13. The discussion went on at considerable length, many times restating several of the points mentioned earlier. Toward the end of the meeting General Carter summarized by observing that it is apparent that flapper valves should be immediately incorporated into all nacelles. In addition he observed that the problem seemed primarily to be one of management, and the need for immediate improvement of the supervisory inspections and techniques is apparent. General Carter commented that he seemed to gather from the discussion that we have to accept whatever labor does, efficient or inefficient. He declared that he does not agree with that principle; and in view of all the "garbage" being removed from the nacelles, he seriously questions the motivation of this labor force. He remarked that [redacted] must be cleaned up, and he stated that the hangar should be a "surgical ward". However, management should know how to rectify the dirty environment. He declared that the present management procedures are "totally unacceptable to me." The General pointed out that the types of improvements which have been recently made at Burbank must be repeated [redacted]. He noted that with regard to the individuals actually working on the aircraft there must be placed into effect a system of checking and double checking to ensure that through carelessness or negligence foreign objects are not left inside the plane. He suggested the possibility of employing a "big brother concept" having one worker observing the work of another if such is necessary. It was pointed out by General Carter that action should be taken to "clobber" workers guilty of repeated acts of carelessness, in order to make an example of such negligent work. (Kelly Johnson agreed and observed that he could not fire the individual because of union rules. However, he would definitely transfer such culprits out of [redacted].) The General concluded by saying that finally, of course, we should continue to increase our preventative security procedures.

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14. Dr. Scoville suggested that in addition to General Carter's observations it might be desirable to set up a

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committee of representatives of Lockheed, [REDACTED] and possibly Mr. Art Smith of the Air Force, to come up with a detailed list of the procedures which should be placed into effect. General Carter interrupted by declaring that the procedures should be placed into effect immediately and not wait for any committee recommendations. Dr. Scoville added that he agreed, but was suggesting that we still have in writing exactly what these improved procedures are. Dr. Scoville then engaged in further discussions with Mr. Kelly Johnson with regard to the desirability of removing nacelles from some of the aircraft [REDACTED] and putting them through the shake process. Kelly Johnson non-concurred. He also non-concurred in the bunny suits again. It was apparent that Mr. Johnson also didn't like the idea of the committee, and it was observed by Mr. Parangosky that the history of the program has always given the responsibility for solving problems to the contractor with the support, of course, of government people as needed. General Carter took note of the apparent reluctance of Mr. Johnson to agree to certain of the suggestions of the group and restated the fact that this is, indeed, a management problem; and if the contractor is not desirous of accepting assistance in the solution of the problem from the government, it might be necessary to re-evaluate the relationship between the contractor and the government. Mr. Johnson suggested that he will have a list of recommended improved procedures by noon Wednesday. Dr. Scoville suggested that in any event the latest aircraft coming off the line in Burbank should not be moved [REDACTED] Kelly Johnson asked Dr. Scoville if he knew what such a decision would mean and asked Dr. Scoville if that was his desire. Dr. Scoville answered that he thought that was what he meant; however, suggest that Mr. Johnson give him the pros and cons. [REDACTED] observed that since the plane wasn't scheduled to move for several days, it would not appear that a final decision was essential at the moment. General Carter stated that a decision with regard to the movement of the latest plane would not have to be made at that time.

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15. On this note the conference adjourned, and General Carter, Dr. Scoville, Colonel Geary and Kelly Johnson departed via the Jet Star for Los Angeles International Airport.

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Chief, Security Staff  
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